IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application:	:	PETITION TO MAKE SPECIAL AND
Number not assigned as of the	:	ADVANCE EXAMINATION PURSUANT
date of this petition.	:	TO 37 CFR §1.102
Art Unit Number: Not yet assigned	:	
Filing Date:	:	
First Named Inventor:	:	
Robert T. Bigelow	:	
Title:	:	
Bulkhead Assembly	:	
Filing Date:	:	
Confirmation Number:	:	
Not yet assigned	:	
	:	
	:	

PETITION TO MAKE SPECIAL AND ADVANCE EXAMINATION

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Commissioner:

Applicant respectfully requests that the patent application for a, "Bulkhead Assembly" be advanced in the examination procedure. This petition and the supporting declaration of Robert T. Bigelow is based upon 37 CFR §1.102 as the invention will materially enhance the quality of the environment and contribute to the development or conservation of energy sources. Referencing 37 CFR §1.102(c), no fee is required for this petition.

INTRODUCTION AND BACKGROUND

Assignee, Bigelow Aerospace (hereafter "Bigelow"), of the present invention is actively engaged in the development and deployment of a privately funded inflatable modular human habitat into space (hereafter "Modular Habitat"). (Declaration of Robert T. Bigelow ¶¶ 1-4, hereafter "Decl. of Bigelow"). To that end, Bigelow has committed tens of millions of dollars in research and development of the various technologies necessary to achieve this goal. (Decl. of Bigelow ¶ 5).

The module has a flexible and inflatable multi-layered shell covering a rigid structural core. The shell can be compressed allowing the module to fit as in the payload compartment of a number of conventional lifting vehicles. When the module is placed in orbit, the shell can be inflated to many times its compressed size. When inflated, the module has more internal volume than a typical hard shell space structure of a similar launch payload size. The extra volume of the inflatable module allows for more crewmembers, equipment, and experiments. Thus, more can be accomplished with a single launch of an inflatable module than can be done with a single hard shell module. (Decl. of Bigelow ¶ 6).

A critical element to the development of an inflatable module is the use of a bulkhead assembly. (Decl. of Bigelow ¶ 7). A bulkhead assembly has four principle functions. (Decl. of Bigelow ¶ 8).

First, the bulkhead assembly is a termination point that retains the ends of the air bladder. This is especially important when the air bladder is fully inflated. (Decl. of Bigelow ¶ 8). Second, the bulkhead assembly retains the ends of the restraint layer. When the air bladder is inflated, the load caused by the inflation of the air bladder is substantially transferred to the restraint layer. (Decl. of Bigelow ¶ 9). Third, the bulkhead assembly is secured to the longerons thereby assisting in defining the structural characteristics of the core. (Decl. of Bigelow ¶ 10). Finally, the bulkhead assembly is used in conjunction with an airlock thereby providing access to the inside of the module and a docked spacecraft or other attached module. (Decl. of Bigelow ¶ 10).

The bulkhead assembly is a critical element in the development of Modular Habitat, and the Modular Habitat is pivotal in progressing areas of space science that will

enhance mankind, the environment and lead to the development, or conservation, of energy. Thus, applicant contends that the present invention is suitable for advancement in the examination process pursuant to 37 CFR 1.102 as embodied in MPEP §708.02.

MATERIAL ENHANCEMENT TO THE ENVIRONMENT AND CONTRIBUTION TO THE DEVELOPMENT OR CONSERVATION OF ENERGY.

The Modular Habitat is a space station that costs less to develop, manufacture, and deploy than current semi-permanent structures in space. (Decl. of Bigelow ¶¶ 3,6). As a result, access to experimentation in the micro-gravity of space would no longer be so cost prohibitive as to afford this opportunity to only governments or private entities with vast resources. The Modular Habitat is a space platform that provides an unparalleled opportunity for people, institutions, governments, and business entities on a much broader demographic to participate in researching numerous areas of science within the environment of space. (Decl. of Bigelow ¶ 11).

It is undisputed that the development of space exploration is anticipated to have a dramatic impact on the advancement of human health and development. (Decl. of Bigelow ¶ 12). Research is currently scheduled, and indeed has been underway, to accelerate breakthroughs in medical science that could significantly improve the human condition. (Decl. of Bigelow ¶ 12). This alone directly improves the environment in which we all live and justifies an expedited review of the method for making an opening in the bladder of an inflatable modular structure for receiving a window.

In the area of biotechnology, in 1997 Dr. Lawrenece T. DeLucas of the Center for Macromolecular Crystallography opined that research into protein crystal growth and tissue culturing in space are expected to have a dramatic effect on the understanding of diseases such as heart disease, stroke, diabetes, and bacterial and parasitic infections. (Decl. of Bigelow ¶ 13). A natural consequence of this research could be more effective treatments of numerous diseases. Better treatment can reduce the need for hospitalization stays and the use of materials associate with those stays such as prescription of other medications, use of disposable items such as plastic gloves paper sheets and gowns, and

cleaning of hospital rooms. It is apparent that such decreased demand would reduce the need to use many of the basic life sustaining natural elements such as water, oxygen, wood based fibers, and the like.

Other areas of research include the investigation of making stronger, better, and longer lasting materials for use on Earth. (Decl. of Bigelow ¶ 14). Such an endeavor reduces the need to replace materials as often, which means that less energy is expended in the making of these materials to replenish worn out items. (Decl. of Bigelow ¶ 15). Such a result is a conservation of energy thus warranting an expedited examination of the application. Further, as less materials need to be manufactured, there is less of a draw on many of the basic life sustaining natural elements such as oxygen and water used in many production processes. (Decl. of Bigelow ¶ 16).

Energy research is another area of investigation. NASA plans to engage in research in combustion science in the micro-gravity environment of space that is expected to have a dramatic effect on the efficiency of combustion engines and dramatically improve the environment. For example, it is estimated that a 2% increase in burner efficiency would save the U.S. $8 billion per year. (Decl. of Bigelow ¶ 17). This increased efficiency should also translate into less pollution in the environment, and would require less oxygen in the combustion process and thus there is less of a draw on a basic life sustaining natural element. While NASA does not currently have plans to conduct such research on the Bigelow Modular Habitat, the Modular Habitat would make this research available to a broader range of experimenters and could thereby increase the research effort in this field. (Decl. of Bigelow ¶ 18).

Pursuant to MPEP §708.02 V, applicant has shown how the invention contributes to the restoration or maintenance of life sustaining elements. Also, in accord with MPEP §708.02 VI, applicant has identified how the invention leads to more efficient utilization or conservation of energy sources. Neither requires a search of the prior art and no such search has been represented herein.

CONCLUSION

A flexible structural restraint layer for use with an inflatable modular structure is instrumental in the deployment of a Modular Habitat in space for research into technologies that would reduce reliance on basic life sustaining natural elements and materially contribute to the utilization and conservation of energy sources. To that end, the flexible structural restraint layer is integral in the creation of the Modular Habitat and contributes to the aforementioned goals.

For the reasons identified herein applicant respectfully requests that the flexible structural restraint layer for use with an inflatable modular structure be advanced in the examination process.

Dated: 12-4-03

Franklin E. Gibbs, Esq.
USPTO No. 44,709

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as required for Express Mail in an envelope addressed to: Mail Stop Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on: 12-4, 2003

Dated: 12-4-03

Franklin E. Gibbs, Esq.
USPTO No. 44,709

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application:	:	DECLARATION OF ROBERT T.
Number not assigned as of the	:	BIGELOW IN SUPPORT OF THE
date of this petition.	:	PETITION TO MAKE SPECIAL AND
Art Unit Number: Not yet assigned	:	ADVANCE EXAMINATION PURSUANT
Filing Date:	:	TO 37 CFR §1.102
First Named Inventor:	:	
Robert T. Bigelow	:	
Title:	:	
Bulkhead Assembly Modular	:	
Structure	:	
Filing Date:	:	
Confirmation Number:	:	
Not yet assigned	:	
	:	

DECLARATION OF ROBERT T. BIGELOW

I, Robert T. Bigelow, do hereby declare:

1. I am the inventor of the bulkhead assembly invention.
2. I am President of Bigelow Aerospace (hereafter "Bigelow"), assignee of the bulkhead assembly invention.
3. Bigelow is developing an inflatable modular human habitat (hereafter "Modular Habitat") for use in Earth Orbit. The Modular Habitat has the advantage of having an inflatable shell that is less heavy than a solid shell per cubic meter of deployed volume and thus less expensive to place into orbit. Also, while a solid shell space station cannot expand to gain more internal volume, the inflatable shell can be inflated to provide more internal working space.
4. Bigelow is privately funded and receives no government funding or grants toward the development of the Modular Habitat.
5. Bigelow has expended tens of millions of dollars in the research and development of a Modular Habitat.

6. The module has a flexible and inflatable multi-layered shell covering a rigid structural core. The shell can be compressed allowing the module to fit as in the payload compartment of a number of conventional lifting vehicles. When the module is placed in orbit, the shell can be inflated to many times its compressed size. When inflated, the module has more internal volume than a typical hard shell space structure of a similar launch payload size. The extra volume of the inflatable module allows for more crewmembers, equipment, and experiments. Thus, more can be accomplished with a single launch of an inflatable module than can be done with a single hard shell module.

7. A key invention to the development of the Modular Habitat is the bulkhead assembly.

8. The bulkhead assembly has four main purposes. First, the bulkhead assembly retains the ends of the air bladder and supports the air bladder when the shell is fully inflated.

9. Second, the bulkhead assembly retains the ends of the restraint layer thereby allowing the transfer of the load caused by inflation of the air bladder shell from the less structural air bladder to the core through the restraint layer.

10. Third, the bulkhead assembly retains the ends of the longerons. This assists in providing the structural integrity of the core. Finally, the bulkhead assembly works in conjunction with an airlock to provide access to the inside of the module with spacecraft and/or other modules.

11. The development of a space based platform for researching various areas of science offers vast potential for identifying breakthrough technologies. This is exemplified in an article by the American Geological Institute published in 1997 and provided herein as Attachment A. This document was downloaded from http://www.agiweb.org/legis105/spacstat.html. Reference to this document does not mean that I subscribe to everything stated in the document. The document is being offered as support to specific areas that are pertinent to this declaration.

12. These areas include advances in the understanding and exploration of human health and development. (Attachment A, page 1, second paragraph).

13. One such area is that of investigating protein crystal growth in a micro-gravity environment. (Attachment A, page 3 starting at the last paragraph).

14. Material science is another area of research. (Attachment A, page 4 starting at the second full paragraph).

15. With the availability of more durable materials to produce items, the items last longer and there is less need for producing replacement items.

16. It is interesting to note that, in general, many manufacturing and production processes rely upon water and air in some fashion. For example, air is used to facilitate combustion in the production of electricity, which in turn powers many production and manufacturing facilities. Water is routinely used for cleaning or to distribute heat.

17. As to combustion technology, even a modest increase in efficiency will have a dramatic impact on the economy and the environment. For example, it is estimated that a 2% increase in burner efficiency would save the U.S. $8 billion per year. Attachment A, page 3 starting at the second full paragraph.

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18. Due to the current expense of placing a space station into orbit, these types of experiments are usually performed by governments. The Modular Habitat will widen the demographic range of people and entities that could afford such experiments and thereby allow access for space experimentation and exploration to a wider group.

I declare under penalty of perjury under the laws of the Untied States of America that the above is accurate and true to the best of my knowledge.

Executed at 1899 W. Brooks Avenue, North Las Vegas, NV 89032, on 12 - 1, 2003.

Robert T Bigelow

Mr. Robert T. Bigelow
President
Bigelow Aerospace